February 26, 2007

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Health and Environmental Control-Bureau of Water
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Subject: SC Water Quality Standards Triennial Review Process
January 26, 2007 Notice of Drafting
Duke Energy Carolinas Comments

Duke Energy Carolinas appreciates the opportunity to participate in the Water Quality Standards triennial review process and to provide comments on specific water quality standards and other matters addressed in R. 61-68, Water Classifications and Standards. We believe that certain standards are currently promulgated at levels more stringent than necessary to adequately protect human health and the indigenous biological community of the state's surface waters. Our specific comments are as follows:

I. ARSENIC STANDARD

The assumptions that EPA used to derive its recommended arsenic water quality standards for organism only, and water and organism consumption, are technically flawed. The rationale and technical justification supporting a change to the South Carolina surface water arsenic standard is addressed below. Therefore, South Carolina's surface water quality arsenic standard as established in Regulation 61-68 should be revised to align with both the South Carolina drinking water and groundwater arsenic standard; i.e. 10 parts per billion (ppb). Revising the surface water arsenic standard will not diminish the protection to human health and the environment because the 10 ppb standard was established by a panel of technical experts, using a peer reviewed process, with the objective to establish a drinking water standard protective of human health. EPA re-evaluated and confirmed the 10 ppb standard as recently as 2003.

RATIONALE FOR REVISING SOUTH CAROLINA'S SURFACE WATER ARSENIC STANDARD

1. EPA's recommended surface water arsenic standards are guidelines only. Many states (36 states, which include North Carolina, Georgia, Tennessee, Texas, and Louisiana) have chosen to establish a surface water arsenic standard less restrictive than what the EPA recommended. Most states have chosen to set their surface water arsenic standard at 10 ppb, which aligns with the drinking water MCL for arsenic. EPA recognizes that the arsenic ambient water quality criterion (AWQC) for protection of human health may be established by states at a level less restrictive than EPA's recommendation.

Adopting an arsenic standard more restrictive than that of other states, particularly Southeastern states, places South Carolina dischargers at a competitive disadvantage.

2. The Electric Power Research Institute (EPRI) conducted a thorough literature search in 2003 which concluded that the EPA recommended 18 ppt (organism only) and 140 ppt (water and organism) arsenic standards are scientifically flawed (Critical Evaluation of Ambient Water Quality Criteria for Arsenic: Speciation and Bioaccumulation Issues, EPRI, Palo Alto, CA: 2003. 1009211). EPRI concluded, and was supported by the EPA Region VI studies conducted in 2001, that arsenic does not readily bioaccumulate in freshwater fish at anywhere near the factors EPA used in their calculations. In fact, studies suggest that freshwater fish have nearly zero bioaccumulation of inorganic arsenic when exposed to concentrations up to 100 ppb arsenic.

   The EPRI study also concluded (based on numerous fish tissue analyses) that EPA used an incorrect inorganic-to-organic arsenic ratio in calculating its organism only arsenic standard. The percent of inorganic arsenic (the carcinogenic form of arsenic) in freshwater fish is actually closer to 8%.

   The EPRI report incorporates a cancer risk factor of 1x10E-6 and an increased fish consumption of 17.5 grams/day. These factors align with current EPA recommendations. Using the revised bioaccumulation and bioconcentration factors, factoring in a conservative 17.5 kg/day daily dietary fish intake, and using an average percent of inorganic arsenic found in freshwater fish tissue, the resulting organism only arsenic standard is approximately 99 ppb. This is a much higher value than the 140 ppt number EPA recommended and indicates that the 18 ppt (water and organism) standard is also flawed.

3. Region VI EPA chose to adopt a 20.5 ppb organism only arsenic standard which is 146 times less restrictive than the 140 ppt standard. EPA Region VI established a regional AWQC arsenic standard for protection of human health and published the standard in the "Region 6 Interim Strategy: Arsenic – Freshwater Human Health Criterion for Fish Consumption" (EPA, 1998). Their organism only arsenic standard was derived using the following criteria/assumptions:

   - A cancer slope factor of 1.75 mg/kg/day and a cancer risk factor of 1: million

   - Bioconcentration factor of 1 kg/L based on data published in the EPA's Great Lakes Imitative.

   - Taking into account that no more than 30% of the arsenic in fish is the harmful inorganic form.

4. The SC drinking water standard for arsenic is 10 ppb. The S.C. groundwater standard is also 10 ppb. The 10 ppb standard for drinking water and groundwater is established to be protective of human health. For consistency, because the 10 ppb arsenic standard for drinking water was established by EPA to be protective of human health, many states (as previously noted) use this standard as their arsenic standard for drinking water, groundwater, and surface water. Since the 10 ppb arsenic standard that South Carolina has established for drinking water and groundwater protection is deemed to be adequately protective of human health, it is sensible to also establish the South Carolina surface water arsenic standard at 10 ppb.

ARSENIC STANDARD-SUMMARY

In summary, the South Carolina surface water quality arsenic standards for the protection of human health should be revised to 10 ppb. Changing both the water and organism standard (currently 18 ppt) and the organism only standard (currently 140 ppt) to 10 ppb would align South Carolina's surface water arsenic standard with South Carolina's groundwater and drinking water standards which are set at the Maximum Concentration Level (MCL). The MCL is a standard established by the EPA, using a rigorous scientific review process, to a level that provides protection to human health. Most states adopt the arsenic MCL as their surface water, groundwater, and drinking water standard.

If S.C. chooses to adopt a standard other than 10 ppb, scientific literature supports the use of a bioconcentration factor of 1.0 and the use of 30% or less as the percentage of inorganic (carcinogenic form) arsenic found in freshwater fish, in calculating the standard.

II. SOURCE WATER PROTECTION PROGRAM

SCDHEC has utilized a guidance document to define a source water protection area. The Source Water Assessment and Protection Program has not been promulgated in compliance with the requirements of the South Carolina Administrative Procedures Act. The Source Water Protection Program does not fairly assess reasonable potential because it uses 7Q10 flow for dilution and 7Q90 for time of travel. Therefore, the Source Water Protection Program should not be used to impose NPDES permit limits/conditions.

III. OTHER COMMENTS

- SCDHEC rules should be clarified to address that a NPDES permit applicant can perform a mixing study as a means of establishing a NPDES limit(s) for discharges into a lake.

- Non-contact cooling water should not be subject to the water quality standards for toxic pollutants (with the exception of biocides and temperature). Non-contact cooling water includes both once through cooling water and re-circulated non-

contact cooling water. Provisions exist in the national steam effluent industry guidelines for regulating non-contact cooling water. SCDHEC should appropriately factor these industry guidelines into their decision making process when establishing requirements for non-contact cooling water. With respect to the steam effluent guidelines, EPA has extensively studied this industry and has concluded that the only parameters that should be regulated for non-contact cooling water are biocides and temperature. Metals, such as copper, should not be regulated in non-contact cooling water unless the metals have been added to the water as a result of operational or maintenance activities.

Please contact me at 704-373-3726 should you have any questions regarding these comments.

Respectfully submitted;

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